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AUTHOR Sobel, Ronald
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ABSTRACT

The specific hypotheses tested were that: (1) participation in a two-week laboratory changes the cognitive structure of those participating; (2) the extent of change varies with the initial level of cognitive complexity of the participant; and (3) the better the match, as seen by the participant, between the complexity of the learning environment and the participant's needs, the greater the increase in cognitive complexity attributable to the training experience. Information regarding the participant's level of cognitive functioning was obtained by administration of Schroder's Paragraph Completion Test, at the opening and at the closing of the laboratory. Assessment of the "match" between the participant's needs and the complexity of the learning environment was made by use of a questionnaire especially prepared for the purpose. Findings were consistent with the first two hypotheses. However, contrary to expectations, the relation was curvilinear rather than linear. Conditions necessary for testing the third hypothesis were not met in the study - when participants were grouped by pre-training level of cognitive structure the match between needs and learning environment was no better for one group than for another. Possible explanations for the curvilinear relation are offered. (Author/CJ)

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"A Study of Cognitive Change Resulting from Participation in Human Relations Laboratory Training"

Ronald Sobel
Yeshiva University
New York, New York

September 15, 1970

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Summary

The purpose of this study was to determine whether a theory of cognitive function, and procedures for assessing levels of cognitive functioning, developed by Harvey, Hunt, and Schroder, could be utilized in determining the impact of laboratory human relations training upon participants in such training programs. The specific hypotheses tested were that (1) participation in a two-week laboratory conducted by the National Training Laboratories changes the cognitive structure of those participating, (2) the extent of change in cognitive structure due to participation varies with the initial level of cognitive complexity of the participant, and (3) the better the match, as seen by the participant, between the complexity of the learning environment and the participant's needs, the greater the increase in cognitive complexity attributable to the training experience.

Information relevant to testing these hypotheses was obtained from eighty-two participants in three two-week training laboratories conducted by NTL Institute at Cedar City, Utah, during the summer of 1969. Information regarding the participant's level of cognitive functioning, and changes in level of functioning, was obtained by administration of Schroder's Paragraph Completion Test, at the opening and at the closing of the laboratory. Assessment of the "match" between the participant's needs and the complexity of the learning environment was made by use of a questionnaire especially prepared for the purpose.

Findings were consistent with the first two hypotheses-there were significant differences between the pre and the post scores in the instrument used to assess level of cognitive functioning. However, contrary to expectations, the relation was curvilinear rather than linear: those initially scoring higher went down and those initially scoring lower went up on the post-training administration of the instrument. Conditions necessary for testing the third hypothesis were not met in the study: when participants were grouped by pre-training level of cognitive structure the extent of match between their needs and the learning environment was found to be no better for one group than for another.

Since it is difficult to believe that laboratory (or any other type of) training would actually reduce the level of cognitive structure of a person, alternative explanations were sought. One is that the results have nothing to do with training but represent an attenuation of the responses to the mean on the second administration of the instrument. This explanation is not compatible with the fact that the instrument has a test-retest reliability of +.80. Another possibility is that on the second administration those initially scoring high gave less importance to the

questionnaire and responded perfunctorily, thus receiving lower scores than on the first administration. While those scoring low on the first administration increased in cognitive structure as a result of the training. Only additional information could assess the likelihood of this explanation, although it is not inconsistent with the cognitive theory on which it is based.

Introduction

In this study we attempt to integrate and derive action implications from two lines of inquiry the potential of which, in our opinion, has not been fully explored; human relations laboratory training, and conceptual systems personality theory. What makes the integration of these two fields of activity intriguing is that, with some exaggeration, one can say that laboratory training is a method of training in search of a theory, and cognitive theory is a theory of interaction and development in search of a training methodology. Recent work in each of the two fields provides rich information for such an integration: Campbell and Dunnette (1968), Harrison (1967), and Buchanan (1969) have made extensive reviews of recent research regarding laboratory training; Harvey (1968), Hunt (1966), and Schroder et al. (1967) and their associates have done important work regarding cognitive structure and the behavioral manifestations of such dispositional tendencies.

Despite the quantity of studies which have been made of human relations laboratory - or "sensitivity" - training, and despite the proliferation of its use in public schools during the last four years, many important issues need to be clarified. Among these are the following:

1. The expected outcomes from laboratory training need to be more explicitly formulated. Without this, it is difficult for an individual or an organization to determine the potential usefulness of the training.

2. Better evidence is needed showing that the outcomes of laboratory training result in changes in job performance which facilitate improved effectiveness in specifiable organizational environments and functions. The importance of work on this issue is indicated by the fact that there is a paucity of information indicating that the more frequently intended and/or observed outcomes of training (such as increased self-awareness, sensitivity to others, etc.) have any relation to effective job performance.

3. Much more information is needed to determine the impact of laboratory training upon different individuals.

As Campbell and Dunnette point out (1968: 99) "... most current researchers seem to act as if laboratory training should have similar effects for everyone"; yet the few studies which provide data on this question suggest that the assumption is unwarranted (Buchanan, 1969:476).

4. There is a need to develop more rigorous linkages between components of laboratory training designs and the learning need of participants, thus providing the basis for improving such designs.

The purpose of the study is to contribute information relevant to these issues. The approach is to utilize theory, findings from empirical studies, and measuring instruments developed in studies of cognitive structure. Specifically, the work of Harvey, Hunt, and Schroder (1961) and their associates is used in deriving some specific hypotheses and in designing a program of inquiry.

In their original study, Harvey, Hunt, and Schroder (1961), presented a conception of cognitive structure as a characteristic of personality and a theory about the processes through which individuals develop different cognative structures. They differentiated between the content or what a person thinks, and the structure or how a person thinks, using aspects of both in characterizing four levels of personality disposition along their major continuum of abstractness-concreteness. Underlying this dimension they posited four other properties - clarity - ambiguity, or the definiteness with which a concept is differentiated; compartmentalization-interrelatedness, or the degree of connectedness among elements following differentiation; centrality-peripherality, or the degree of dependence of other concepts upon a given element; and, openness-closedness, or the receptivity of the construct system to deviant events. They also hypothesized the content which was of most concern to people at each cognitive level. They formulated some ideas regarding the dimensions of the environment or of a training condition which facilitate or impede the development of increasingly complex structure. And they worked out expected relations between levels of cognitive structure and behavior.

These three researchers have continued to build upon the original work, each with a special exphasis. In his more recent work, Schroder places more emphasis on differences in structural properties which pertain to information processing rather than to concrete-abstractness and gives less emphasis to content. He (Schroder, Driver, and Streufert, 1967) and Harvey (1966), have each developed a measure of cognitive structure, and Hunt (1966) has made more explicit a model of learning.

We will now review information from recent studies by Harvey, Hunt and Schroder and their associates which appear to be relevant to the problems in human relations laboratory training outlined in the above.

Both Harvey and Schroder have produced a wealth of information regarding behaviors associated with differences in cognitive structure. Since they used different measuring instruments and since they conceptualize cognitive structure somewhat differently, it is necessary to summarize these findings separately.

Harvey and associates (Harvey, 1968) have found that persons characterized on his instrument as more "abstract" as compared with those characterized as more "concrete" displayed:

a. Greater capacity to "act as if", to assume the role of the other, and to think and act in terms of a hypothetical situation,
b. Greater ability to think subordinately and superordinately and thus with a greater range of methods for solving problems,
c. Hold opinions with less strength and with greater expectation that the opinions will change with time,
d. Greater ability to change set and hence less stereotype in the solution of complex and changing problems of high involvement,
e. Greater tendency toward innovative and creative responses,
f. Less evaluative, extreme, and polarized judgments,
g. Less dependence on social cues related to role, status, and formal authority as guidelines to judgments,
h. Greater sensitivity to subtle and minimal cues and hence less susceptability to false but obtrusive ones, and
i. Lower score on the factor of dictorialness as reflected in such behavior as high need for structure, low flexibility, high rule orientation, frequent use of unexplained rules.

Schroder and Associates (1967; Lee, 1968) found that the higher the conceptual level of a person:

a. The greater the amount of discrepant information "tracked" (differentiated) and utilized in decision-making (Schroder et al., 1967, p. 114).
b. The greater the amount of information which was tracked and utilized was affected by the uncertainty of the situation (Schroder et al., 1967, p. 114).
c. The greater the number and the complexity of strategies generated and used in adapting to the environment "Persons who use more integratively complex conceptual

structures take more situational aspects into account in processing information and perceptions in general are less static and absolute." (Schroder et al., 1967, p.140).

d. The less the tendency to overgeneralize, including less tendency to criticize other group members after failure in a complex group task situation (Schroder et al., 1967, p.140).

e. The less the resistance to change at lower levels of stress but the less the likelihood of collapsing or "going to pieces" under high stress (Schroder et al., 1967, p.142).

f. The greater the number of alternative perspectives of a stimulus person generated in response to interpersonal conflict (Lee, 1968, p.75; Karlins, 1967).

g. The greater the openness to the points of view of others (Lee, 1968, p.77; Stager, 1967).

Schroder, Driver, and Streufert (1967, p.31) found evidence for the following as characteristic of the environment which account for differences in the impact of people's having different cognitive structures.

a. Information load, as indicated by (1) information restriction versus excessive information, (2) static and unchanging situations versus emergent and changing ones, and (3) familiar versus novel situations,

b. Set, as indicated by (1) the severity of adverse consequences of behavior, (2) the amount of reward or promise given by the environment, (3) the person's interest in the task, and (4) the degree to which the situation refutes or disorients the person, and

c. Organization properties of the environment such as (1) training methods used, (2) number of individuals cooperating in the task, and the degree of interaction required by the task, (3) extent to which diverse viewpoints are generated, and (4) facilities for bringing diverse viewpoints together for resolving the conflict.

In terms of cognitive theory a given content of information can be taught under many different training conditions. "But integratively complex structural properties evolve through the development of new and conflicting differentiations (new interpretations of the same event) and the use of new and more complex rules to integrate and unite these differentiated components" (Schroder et al., 1967, p.45). Issues which are considered to be relevant to establishing a climate for the development of complex structure are the following:

a. External vs. internal rewards. When rewards for behavior are controlled by an outside agent (parents, trainer, boss), the trainee learns to adapt by looking for

external schemata for organizing his experiences (Schroder et al., 1967 p.47), and the conceptual system which results "tends to be ritualistic adherence to rules without understanding..." (Harvey, 1968, p.8).

Source of differentiations and integrative rules. If the outside agent provides the person with ready-made rules and differentiations then the person may learn the rules and acquire information but not develop schemata for utilizing the acquired information or for developing increasingly abstract structural properties.

c. Relevant characteristics of the task environment. An environment conducive to growth (1) encourages the person to explore the environment, (2) contains all the components of the desired goal, (3) provides information as feedback, and (4) permits the person to experience the consequences of these exploratory actions (Schroder et al., 1967, pp.48-49).

d. Complexity of the environment vs. the stage of development. If the environment is overly simple for the person it will lack challenge and thus not stimulate growth. This can happen if the trainer provides rules or schemata which the trainee could generate for himself, or if the trainer protects the trainee from the consequences of his own activities. From the trainer's point of view, "'protection' represents an awareness that the environment is too complex for the subject. The trainer protects the trainee rather than effecting environmental change." (Schroder et al., 1967, p.51). If the individual is pushed beyond his ability, through pressure from the trainer or from an excessively complicated environment, then the potential; either overly simple or overly complex environments (for the trainee in question) results in "arrestation" of development (Schroder et al., 1967, p.50; Hunt, 1968).

e. Content of learning. Especially in Schroder's formulations a clear distinction is made between content and the structure of a person's adaptive orientation, and it is stated that how structure varies across different stimulus domains is not known (Schroder et al., 1967, pp. 128-129). But in their earlier work, Harvey, Hunt, and Schroder (1961; and Harvey in his current work) specified the content of high ego involvement for persons at each conceptual level: at the lowest level concern is with conformance with rules, with power, with status - or with external authority. At the next level, concern is with negative attitudes toward external authority. At the third level, it is with pleasing others, and individuals at this level are "vulnerable to threat of rejection, social isolation, and other social conditions that would prevent them from being dependent and having others dependent upon them. (Harvey, 1968). At the highest level, persons are concerned about intrinsic rewards and are open to interaction with their environment.

What makes us excited about the potential of utilizing the cognitive theory of Harvey, Hunt and Schroder in improving laboratory training are the following:

1. There is a striking similarity between the behaviors associated with persons of high cognitive structure as found by Harvey and by Schroder (as indicated in the review above) and the more frequently mentioned objectives of laboratory training (see for example, Bennis, 1962). Thus change in cognitive structure might be considered as a genotypical goal of laboratory training while usually-stated ones are phenotypicalgoals. This is relevant to the first issue mentioned above: changes in cognitive structure of participants could become an explicit goal of laboratory training.

2. As indicated in the summary above, Schroder et al., (1967) have provided theoretical and empirical information on the basis of which one can predict the kinds of jobs and work situations in which increases in the cognitive complexity of the incumbent would lead to improved job performance. If indeed laboratory training is found to increase the cognitive complexity of at least some participants, Schroder's findings could be used in selecting people whose jobs are such that the training would improve performance - and thus throw light on the second issue mentioned above.

3. Both Harvey and Schroder provide measures for assessing the cognitive structure of individuals. This is relevant to the third issue in laboratory training: their measures could be used on a pre-training basis to determine who learns from such training and on a pre-post basis to assess change as a result of such training.

4. Their theory regarding conditions of learning (i.e., progression from concrete to abstract structure) provides clues for designing training situations which are optimum for individuals of differing initial cognitive level-information relevant to the fourth issue posed above.

This leads us to the hypotheses tested in the present study:

1. Participation in a summer laboratory conducted by the National Training Laboratories changes the cognitive structure of those participating.

2. The extent of change in cognitive structure attributable to participation in a laboratory varies with the initial cognitive complexity of the participant.

3. The better the match, as seen by the participant, between the learning environment and his own learning needs, the greater the increase in cognitive complexity attributable to the training experience.

Method

Subjects: The subjects for the study were the participants in the three concurrent laboratories conducted at Cedar City, Utah in August, 1969, by the National Training Laboratories. These laboratories were selected for the study since they were of two-week duration, were conducted by NTL staff members under NTL auspices, access to them was readily obtained since the researcher's supervisor was a member of the staff of one of the laboratories, and they appeared to be "typical" of those regularly offered by NTL. Of the three, one was a "basic human relations" laboratory, one for higher education, and the other a "community" laboratory (NTL Institute, n.d.).

Instruments: Both Harvey and Schroder have developed instruments for assessing the cognitive structure of individuals, and either seemed appropriate in the present study. In another study (Buchanan, 1968) it was found that Harvey's "This I Believe" instrument did not sufficiently discriminate among individuals like those who attend human relations laboratories, and so Schroder's "Paragraph Completion Test" was used. Information available (Schroder, personal communication) indicates that the instrument has a test-re-test reliability of .80 (based on a college student population), and its usefulness in predicting differences in behavior relevant to this study, is indicated in the first section of this paper. A copy of the instrument is included in Appendix A.

So far as we know there was no instrument available for assessing aspects of the learning climate in ways relevant to the purposes of the study, so one had to be constructed. This was done on the basis of cognitive theory, summarized above. That is, items were included in the questionnaire for each major element mentioned in the theory, and where it made sense to do so response categories were stated in terms of the theory (i.e. over-load, under-load, etc.) In scoring the questionnaire, each item was assumed to have equal importance, and the response at the mid-point of each scale was considered to represent the best match between the trainee's needs and the training

climate provided. For example item three dealt with risk-taking, "To what extent were conditions such that you felt like taking risks, "and the response categories were - 1. "not at all" through seven "completely supportive of risk-taking." It was assumed that if the climate was completely supportive of risk-taking, it really wasn't a risk, and if the climate was "not at all" supportive it would constitute an over-load to take risks. One score for each person was obtained as follows: "Good match" was assigned to those individuals who scored 3, 4, or 5 on five or six of the six items; "Moderate match" to those who scored 3, 4, or 5 on three or four items; and "Poor match" to those individuals who scored 3, 4, or 5 on less than three of the items.

As part of its development, the questionnaire was administered to two groups of participants in laboratory-like training at Yeshiva University from which information was obtained regarding its answerability, and its face validity, and it was modified accordingly. It is used in the present study without prior information regarding its reliability. A copy is included in Appendix A.

Procedure: The Paragraph Completion Test (PCT) was administered to the participants in each of the three laboratories at the end of the orientation session at the beginning of the laboratory, and again at the opening of the session on the last evening of the laboratory. Responses were scored by one of Schroder's assistants at Princeton University. The "Training Climate Questionnaire" (TCQ) was administered at a time when the laboratory was about three quarters completed, our assumption being that at that time the climate had become set, but was not yet influenced by the culminating activities.

The number of participants completing the pre-training administration of the PCT was one hundred eighteen. Useable post-training responses were not obtained for thirty-six of the participants since some left the laboratories early (5) some responses were incomplete and thus not scoreable (23) and some (11) attended a fund raising activity for scholarships, the night of the data-collection. The number of useable responses by laboratory were as follows: Human Relations-36, Community and Education-15, and Higher Education-31.

The pre-training PCT scores, of the participants in each of the three laboratories were compared to determine if the three populations were significantly different. This was necessary to utilize the results from the three laboratories in one statistical analysis. The mean scores obtained for the Human Relations, Community and Educational

Leadership, and the Higher Education laboratory were 4.6, 5.0, and 4.4 respectively. Using a Chi Square analysis of the results the differences were found to be non-significant.

If the designs of the laboratories produced significantly different environments one would expect significantly different cognitive change results. The mean cognitive changes for the three laboratories were -.06 (Higher Education), +.4 (Human Relations), and -.2 (Community and Educational Leadership). The results of the Chi Square analysis of these data were not found to be significant, and the designs were accepted as equivalent in their impact.

The procedure for testing the first hypothesis was to determine whether the mean scores on the post-training PCT would be significantly different (.05 level) from the mean score on the pre PCT. A t-test of significance between means was used. The second hypothesis was tested by dividing the participants into two groups (those who scored low in cognitive structure on the pre PCT and those who scored high in cognitive structure on the pre PCT), and testing whether a significant difference (.05 level) existed between the two cognitive change means. The procedure for testing the third hypothesis was to divide the participants into three groups on the TCQ according to the procedure described above. The significance of the difference in the mean change on the pre-post administration of the PCT is to be determined for each of the three categories on the TCQ.

Results: Table I - Pre and post-training scores on the Paragraph Completion Test.

Standing on the Pre PCT	Standing on the Post PCT 8	7	6	5	4	3	2	Total
8			1					1
7			2	1	1			4
6	1	2	4	5	2			14
5		1	4	5	12	1	1	24
4		2	5	10	12			29
3				2	5	1		8
2					2			2
Tot.	1	5	16	23	34	2	1	82

Information regarding the participants' standing on the pre-training and on the post training administrations of the measure of cognitive structure is presented in Table I. Analysis indicated that the difference between mean responses on the two sets of measures is not significant. However, inspection of the table suggests that the relation between standing on the pre and on the post administration of the PCT is curvilinear. To test this possibility the subjects were sorted into high (score of 5,6,7 or 8) and low (score of 2,3 or 4) cognitive structure on the pre administration - the basis of this division being the one Schroder uses (personal communication) to differentiate his subjects and the fact that this division point comes the closest in sorting the subjects of this study into equal halves. The difference between the means of the pre (M=3.71) and the post (M=4.71) for the subjects initially low in cognitive structure (diff. = +1.00) is highly significant (t= 7.00). Comparable figures for the subjects initially high in cognitive structure (pre mean of 5.90, post mean of 5.00, a difference of -.9 is also highly significant (.01 level). For all the subjects, the correlation between pre and post standings on the PCT was found to be +.272; this is considerably smaller than the test-retest reliability assessment of the instrument (a difference which yields a z of 7.45 and is highly significant).

The findings reported above are consistent with both the first and the second hypotheses of the present study: scores on the post-training administration of the measure of cognitive structure were significantly different from the scores on the pre-training administration, and the extent of change was found to vary with the initial cognitive complexity of the participants.

Information regarding the nature of the training environment, as seen by the participants, is presented in tables II and III. Table II shows the frequency of responses on each scale value for the six items on the questionnaire. Although this was not stated as an hypothesis, we expected, on the basis of Schroder's theory, systematic differences in the way the climate was viewed by subjects scoring in the different categories of PCT - that is, we expected the laboratory training climate to be a good match for participants scoring at a certain level on cognitive structure, an overload for those scoring below these for whom the climate was optimum and an underload for those scoring higher in cognitive structure than those for whom it was optimum. Inspection of the pre PCT scores for those scoring high, moderate and low on the TCQ indicates that is not the case and instead the differences are random.

Table II- Frequency for Distribution of "Training Climate Questionnaire" by Item for Different Levels of Cognitive Functioning.

		Scale Values						
		1	2	3	4	5	6	7
Item 1	High*	0	5	11	14	6	5	0
	Low	0	6	8	11	8	3	2
Item 2	High	0	7	15	16	2	1	0
	Low	2	5	10	12	2	2	0
Item 3	High	0	2	6	10	12	10	1
	Low	0	3	10	9	8	5	3
Item 4	High	0	5	8	4	9	10	5
	Low	1	3	11	6	6	6	5
Item 5	High	1	0	5	13	13	9	0
	Low	1	2	7	5	13	6	4
Item 6	High	0	1	9	4	16	11	0
	Low	0	0	3	12	15	7	1

*High and Low refer to different levels of cognitive functioning. High includes those who scored five, six, seven, or eight on the pre PCT. Low includes those who scored two, three, or four on the pre PCT.

Table III presents the mean PCT responses on the pre-training and on the post-training administrations of PCT for those who indicated that the training was a poor, moderate, and a good match for them, together with the differences in the sets of scores for each of the three categories of "goodness of match." Analysis of these differences indicate they are not statistically significant ($X = 5.23$, $p > .10$), with what difference there is being accounted for by change in those who reported a poor match between training climate and their own needs. Thus, the third hypothesis of this study - that the better the match the greater the increase in cognitive structure - is not supported, and in fact the outcome is in the opposite direction of that called for by the hypothesis.

Table III. Goodness of Match on the Training Climate Questionnaire

	Degree of Match		
	Poor	Moderate	Good
	N=7	N=41	N=31
Pre PCT Mean	4.28	4.80	4.61
Post PCT Mean	5.42	4.79	4.98
Difference Bet.Pre-Post	1.15	-.02	.35

Discussion

Although the findings were consistent with the hypothesis that laboratory training would result in changes in the cognitive structure of participants, the findings that the initially higher structure participants decreased in cognitive structure was contrary to theoretical expectations. In Harvey et al (1961), progression to higher levels of cognitive functioning and arrestation at different levels are explained, but nowhere in their theory is there any indication that individuals can decrease their cognitive structure. Persons functioning at higher cognitive levels, given an overly simple or overly complex environment, have been shown to be able to function at a lower level during the experiment, but they retain their complex structures. (Schroder et al., 1967). A check on the PCT scores could have been the TCQ. Had the scores on the TCQ followed the theoretical expectation we would have had differential results according to the match between individual need and the environment. We would then be able to view the PCT results for the more complex in relation to

how they rated their environment. A poor environmental match could give some indication as to the reason for the negative findings. Another source of information, which we hoped to obtain but were unable to - namely, the trainer ratings of change - would have helped clarify this issue by providing an independent measure of the outcomes. Two further possibilities which we have considered are:

1. The changes by those initially high and those initially low on the "Paragraph Completion Test" represent a"regression to the mean" and thus are artifacts of the methodology. This seems unlikely since the changes were statistically significant, and in view of the test-re-test reliability of the instrument.

2. On the second administration of the "Paragraph Completion Test" those initially scoring high would be preoccupied with integrating the laboratory material, that an ambivalent situation would be produced, which would reduce the importance of answering the questions for a second time. With the greater variety of information and the greater number of manipulations of the material (Harvey et al., 1961; Schroder et al., 1967; and Sieber and Lanzetta, 1964), more confusion would be present for the more cognitively complex individual. As Buchanan (1969) points out, "the main immediate effect (of laboratory training) may be uncertainty, discomfort, and experimentation," "which after the passage of time "gives way to confidence, new behavior and stabilization." (p.467) The uncertainty might be greater for the more complex participants since they are more open to processing material that is inconsistent with their beliefs.

The increase in cognitive structure by those who initially scored low on the "Paragraph Completion Test" was consistent with the first hypothesis. In an unstructured environment (as is the laboratory environment), it is more likely that dissonance will be produced in a concrete individual than an abstract individual (Harvey et al., 1961; Harvey, 1965; and Clapp, 1964). Following Festinger's theory of dissonance reduction, the concrete individual would seek to reduce the dissonance produced by seeking consonant elements. One method by which concrete individuals reduce stress is by modeling the behavior of an authority figure. (Harvey et al., 1961). In the training environment the trainer may be seen by the concrete individual as an authority figure and the trainer's behavior may be accepted as the model, thereby reducing the dissonance produced by the unstructured situation. Part of the reward system in laboratory is directed toward increasing the participant's

awareness of alternatives in problem solving as well as developing a spirit of inquiry (Bennis, 1964). The movement of the concrete participant toward these two goals and others would reduce the dissonance. The acceptance of the laboratory goals could change the focus of the answers to the items on the "Paragraph Completion Test," from polarized judgments to ones in which alternatives are considered.

One of the important assumptions related to the third hypothesis was that participants with different cognitive structures would rate the complexity of the environment differentially. Testing this assumption we found that the climate did not vary with the initial "Paragraph Completion Test" scores. Either the theory is incorrect or the measuring instrument is inaccurate. The laboratory environment was such that the participants were involved in several groups, each having its unique environment. Therefore, the laboratory did not consist of one environment, and each of the several environments would have to be rated in order to achieve more accurate results. Another difficulty could have been the ambiguity of certain items on the "Training Climate Questionnaire." In scoring the "Training Climate Questionnaire" there was some difficulty as to which scale points were indicative of a good match for items three to six.

Conclusion

The initial argument that Harvey, Hunt, and Schroder's theory can be utilized in a) stating the goals, b) measuring impact, c) predicting who will gain most from a typical training laboratory, and d) modifying laboratory designs to meet the unique needs of those who don't benefit from typical laboratories, is promising. These objectives should be investigated further by attempting to overcome some of the limitations in the present study; specifically, additional work in developing a measure of match between the participant's needs and the training climate is needed, as is another study in which the "Paragraph Completion Test" is administered approximately four months after the training, and in which another measure-such as trainer ratings- is obtained regarding the impact of the training. Another assessment, such as Supervisor or peer rating (perhaps a modification of the Miles-Bunker procedure) should be obtained regarding change on the job.

Appendix A

Name _____

Paragraph Completion

On the following pages you will be asked to complete certain sentences and write a short paragraph.

On each page you will find the beginning of a sentence and your task is to complete it.

For example, I like . . . .

When you are given the signal, turn to the first page. Complete the sentence given and write at least two additional sentences. You will be given 130 seconds. After 110 seconds, we will say "Finish your sentence." Make sure you complete your last sentence.

Write your sentences as quickly but as clearly as possible.

Do not turn this page until you are given the signal.

When preparing a lesson plan . . .

Try to write at least 3 sentences.

Do not turn this page until you are given the signal.

Rules . . .

Try to write at least 3 sentences

Do not turn this page until you are given the signal.

When I am criticized . . .

Try to write at least 3 sentences

Do not turn this page until you are given the signal

When I am in doubt . . .

Try to write at least 3 sentences.

Do not turn this page until you are given the signal.

When others criticize me it usually means . . .

Try to write at least 3 sentences.

Do not turn this page until you are given the signal.

When I am confused . . .

Try to write at least 3 sentences.

Do not turn this page until you are given the signal.

Appendix A

For All Labs
(Research) 8/4/69

Training Climate Questionnaire

The purpose of this questionnaire is to provide information regarding the climate which is being generated for you in this lab. Since it is likely that this varies, respond to the following in terms of the last few days.

1. To what extent have conditions in this lab challenged you to perform at your maximum capacity?

1	2	3	4	5	6	7
"Under-load" overly simple			Just right amount of complexity made me stretch but was manageable			"Over-load"- confusing

2. To what extent have conditions in this lab provided you with support and encouragement which was optimum for your learning?

1	2	3	4	5	6	7
Too little- cold, distant			Just right provided me warmth, with room to be myself			Too much smothering

3. To what extent were conditions such that you felt like taking risks?

1	2	3	4	5	6	7
Not at all						Completely supportive of risk-taking

4. To what extent have conditions encouraged you to work toward goals which were important to you?

1	2	3	4	5	6	7
Highly discouraged						Highly encouraged

5. To what extent did conditions make it possible for you to determine the consequences of your behavior in the group?

1	2	3	4	5	6	7
Completely impossible						Completely possible

6. To what extent have conditions enabled you to be aware of what other members needed if you were to contribute to their learning?

1	2	3	4	5	6	7
Completely unable to determine others' needs						Completely able to determine others' needs

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